**University Of Ruhuna**

Matara, Sri Lanka

# EMPLOYEE MANAGEMENT SYSTEM FOR DOCK WORKERS

GROUP NO 01

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# Abstract

Software applications have been used in different industries to support the operations of employees with the advancement of information technology. They streamline employee management and payroll activities which are manually complex and time-consuming. These applications accurately calculate salaries, simplify employee tracking and generate reports for administration minimizing manual efforts and increasing productivity.

Dock labour systems operate with a large pool of less educated and casual workers to have a high degree of operational flexibility. In contrast to educated workers who have the potential to adjust to new technologies, implementing information technology services for dockworkers needs careful requirement analysis and simple design that cater to end-users. Therefore, the objectives of this study are to design and implement an effective employee management application for a company that deals with non-tech dockworkers in calculating employee absences, leave, overtime, salaries, payslips and generating reports for owners to view employee data and attendance for strategic planning.

The methodology used for the study includes systematic requirement analysis using interviews with employees and company owners, and Software-Development-Life-Cycle. We have selected BPES company which provides services to all the container terminals in Sri Lanka. It hires more than one hundred employees to provide the service and dealt with manual management processes wasting time. Thus, the proposed novel web-based solution for BPES design to efficiently handle the employee management, payrolls and administration support dealing with dockworkers.

The front end of the proposed solution uses HTML, CSS, JS and jQuery to give simple and effective user interfaces while the back-end of the system is developed using Apache server, PHP and MySQL database server which is free and open-source to support low cost. A thorough system testing by developers and acceptance testing by users was done to validate the acceptability. The results revealed end-users' requirements are satisfied by the proposed solution.

# Chapter 01: Introduction

ZPMC Lanka Company (Private) Limited is a Board of Investment of Sri Lanka approved company, established to provide services to the port sector of Sri Lanka and the region. ZPMC Lanka Company (Pvt) Limited has contract based other companies to provide the service to the port sector. Therefore, ZPMC Lanka is having BPES Company. Currently ZPMC Lanka and BPES Company are providing its services to all the container terminals in Sri Lanka including maintenance contract for container handling equipment and facility maintenance for Colombo International Container Terminals (CICT), special repairs and spare parts supply for the South Asia Gateway Terminals (Pvt) Ltd of port of Colombo and Sri Lanka Ports Authority.

Companies do the maintenance for two types of cranes, namely Gantry cranes (quay cranes - QC) and Rubber tire gantry (RTG) cranes.

These cranes should be repaired, maintained, painted in proper way. BPES is provided relevant people to do these things. That means BPES Company do a manpower which is your staffing provider delivering jobs hiring, career resources and education based on your career goals. BPES Company is hired different type of technicians to do these duties like mechanical, electrical etc.

We are supposed to target the manpower of the BPES Company because they are hiring more than one hundreds of employees to provide the service. And also, they are wasting huge time to calculate that employees' salaries. Therefore, we supposed to limit that time wastage and smooth their current business process in this system.
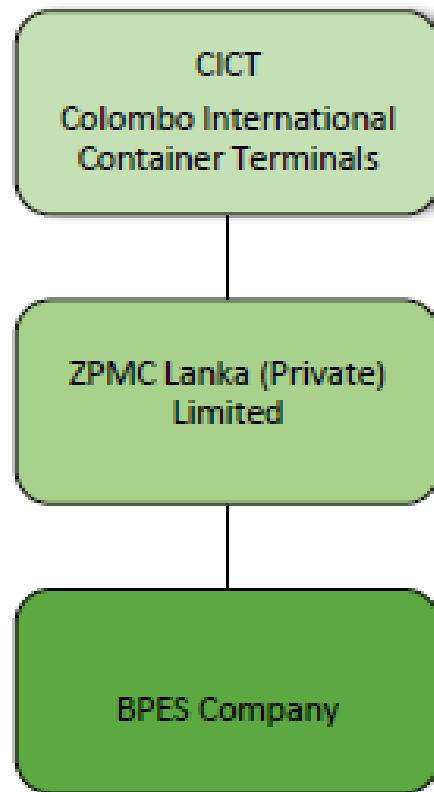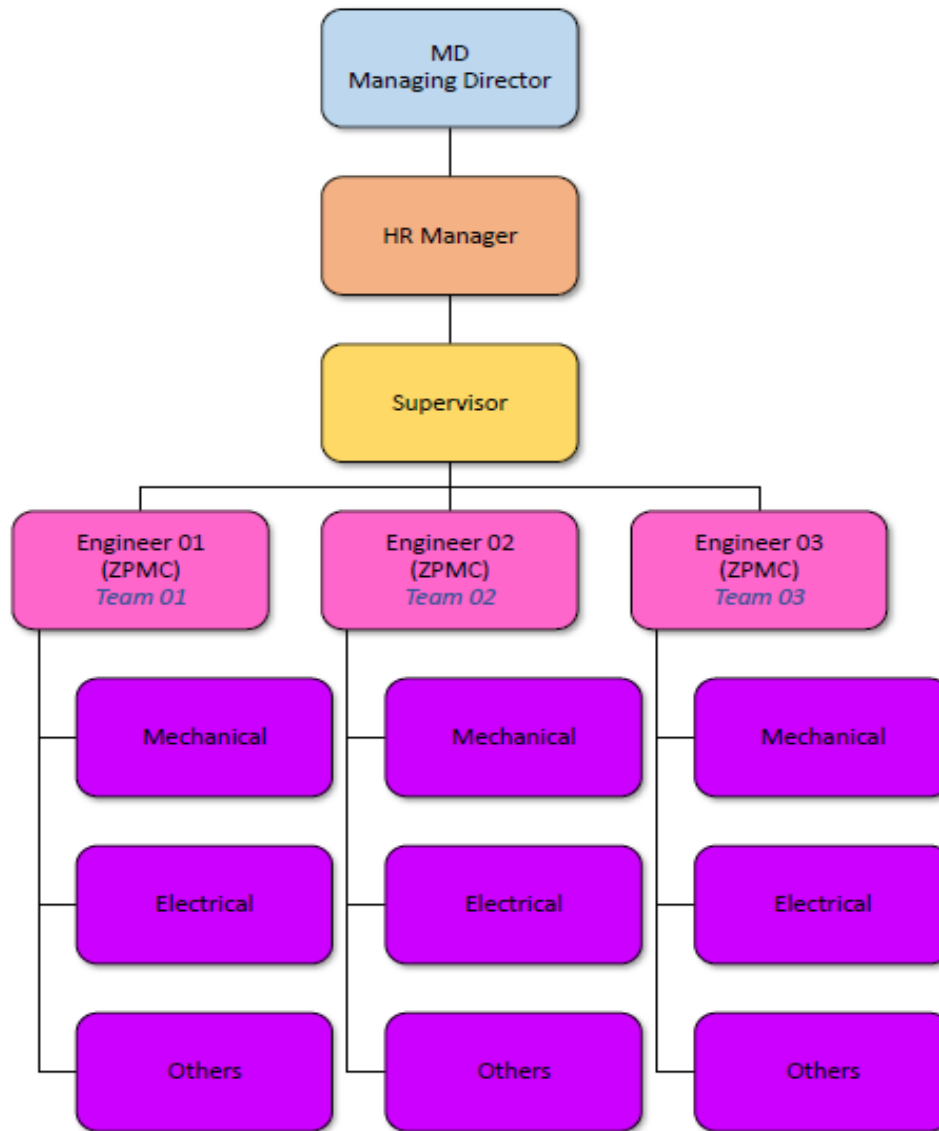
**Figure 1: Company Hierarchy**

**Figure 2: Employee Hierarchy**

## 1.1 Background

BPES Company hire the skilled and semi-skilled technicians to carry out this job. BPES Company doesn't give the shift job duties for the employees. The employees of the BPES Company are worked on day time (8.00 am to 5.00 pm duty) under the labor rule policy and their attendance are taken from the fingerprint machine. The process of BPES is as follows;

1. The supervisor of this company receive the fingerprint details of excel sheet from the HR Manager of the ZPMC Company and he send this excel sheet to the relevant team engineer to approve his employee's attendance.
2. The relevant engineer of the team daily note down each employee's attendance and each employee submit OT sheet document to engineer when they work over time.
3. After the engineer receives the fingerprint sheet, he compares the given sheet and his journal and correcting the sheet if there any mistake in it and then mails to the supervisor after approving it.
4. Then the supervisor collects fifteen days attendance details like above mentioned way and mailed to the HR manager once in fifteen days.
5. The HR manager has excel sheet and he has to copy and paste the all check-in and check-out time of each employee to his excel sheet manually.

They have an excel sheet to calculate the employee salary at the end of the month but this process takes quite long time to calculate the salaries. Most of the time they will unable to give the employees' salaries at the right day.

## 1.2 Problem Definition

- Huge time waste on salary calculation.
  The main target of this project is reducing the time period to calculate the salaries of each employee at the end of the month and smooth their current process. Because of that the HR Manager spend a quite long time to calculate all the employees who are working for the BPES Company. Sometimes the HR Manager is unable to finish the calculation at the right time.

- Manually input employee check in and check out times details.
  HR Manager is having a normal excel sheet and HR Manager has to input employee's check-in and check-out details manually like copy and paste to their excel sheet. During that copy paste process, if there is some date or time format is mismatched, HR Manager is wasting too much time to correct that error.

- Unable to give approved attendance details right on time.
  Sometimes the supervisor unable to give the approved attendance sheet to the HR Manager because the team engineer is not an employee of the BPES Company, he is an employee of ZPMC Company. Therefore, they have to do many duties in the harbor rather than checking the attendance of the employees of BPES Company at each day. Due to that issue, engineer give approve for fifteen days likewise. As well as supervisor has to collect those OT sheet forms from the engineer.

- Most of time the employees are complaining due to this delay of the salaries.

This is a huge problem in this company. That's why we are supposed to reduce that time and smooth the current business process.

## 1.3 Objectives

The aim of this project is to create efficient employee management system to reduce the time to calculate the employee salary by using web-based technologies.

In order to obtain the general objectives, the following list of specific objectives are set:

- Uploading fingerprints excel sheet, system will be read it and checking the day is weekday or weekend or holiday then save the attendance of each employee according to their check in and check out time calculating the OT.

- To develop the employee registration function

- To facilitate the calculating the salaries of employees at the end of the month when uploading the excel sheet data.

- To facilitate the display the employee attendance details, salary details, personal details at one place by selecting employee id/month

- Generate the reports/charts of the salary and attendance details of employees

- To facilitate the employee attendance corrections update/change

- To facilitate to employee to see their worked days, holidays, public holidays and NOT(Normal Over Time) , OT(Over Time) count

# Chapter 02: Analysis and System Specification

## 2.1 Requirement Collection and Analysis

System analysis understands the needs of a system, to be implemented. Initial step of the system analysis is to find out how the existing system works. This helps to get a better understanding about the problems and limitations in the existing system and whether they can be overcome by the proposed system up to a certain extent. System analysis is the basis for the system to be implemented.
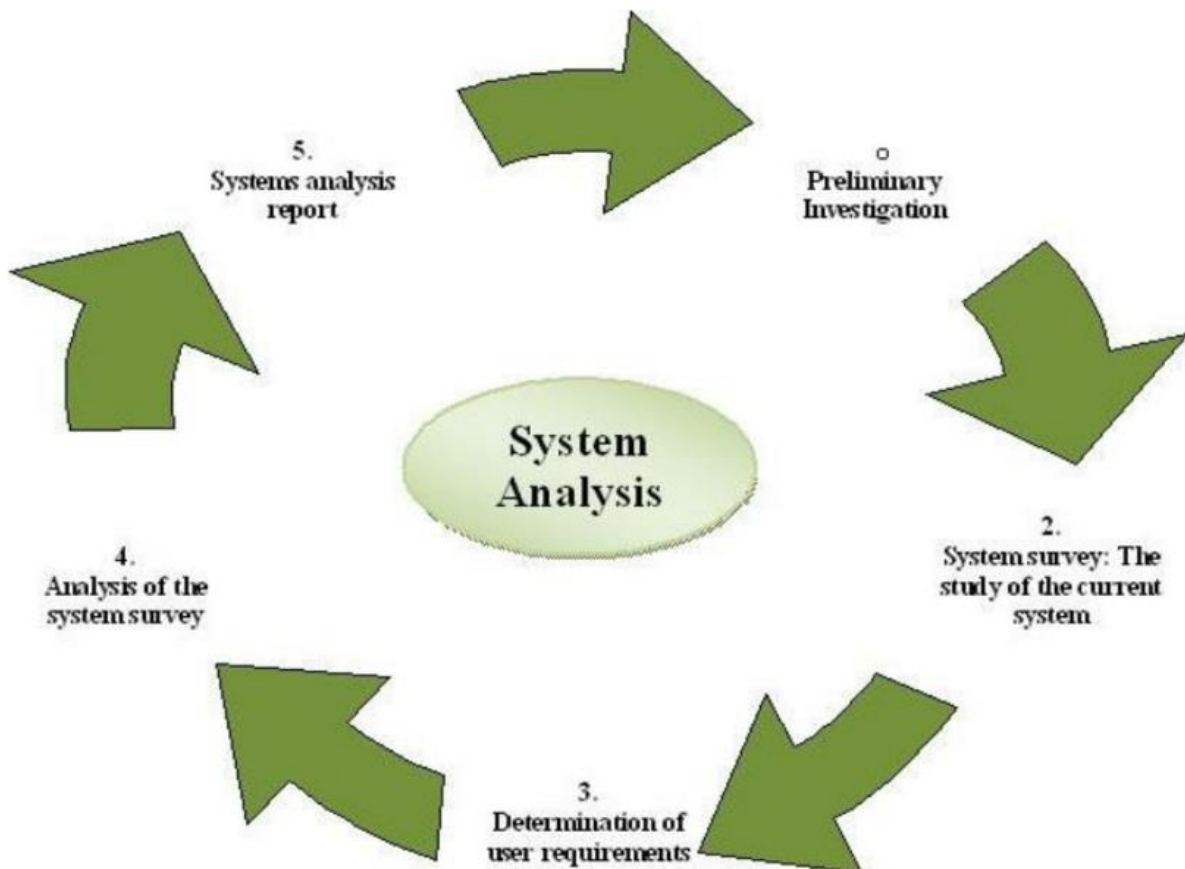
To accomplish system analysis, we have to collect data about the existing system and identify requirements to develop our proposed system. Once we got the idea of developing a employee management system, we have sought for an initiating step to initialize our project. With that idea in our mind, we meet to the BPES company HR Manager in order to collect information about the existing process. We have got much information from the HR Manager Mrs.Charani Adarupotha. Also, we have gained a clear idea from first step to the last step of that process.

After analyzing the data, we gathered from the BPES company, we have observed that the process of calculating salary in this company. So, we had to give up the idea of developing our system for that process. After discussing with our supervisor, we came up with the idea of developing the system for employee management system.

When we received the information, she gave us copies of some of the documents in their current process. The following are examples of those documents.

A

RICHARD

$\frac{25,000}{26} = 961.53$

Days Worked = ~~26~~ 27.5
NoT = 75
DOT = 12
~~Basic Salary~~ = ~~25,000~~

Basic Salary

Weekdays & SAT (20) = 19,230.60   (961.53×20)
Sunday (3) = 4,326.88   (961.53×1.5×3)

~~Prayer~~
Holiday Basic = 2884.59   (961.53×1+2×961.53)
(Poya, Public)

Bra 1 } 140×25 = 1000.00   } $\frac{3500}{25}$ . 140
Bra 2 } = 2,500.00

Total For EPF&ETF = 29,942.07

Normal OT Pay (75) = 14,062.50   [$\frac{25,000}{200(8hr)} \times 1.5 \times 75$]
Double OT Pay (12) = 3,000.00   [$\frac{25,000}{200} \times (2) \times 12$]

Travelling allowance = 5000.
Attendance all. = 5000   25 > 5000
Gross salary = 57,004.57   23.5 < x < 25  3750
                              22.5 < x < 23.5  250.
EpF 8% × (29,942.51) = (2395.36)
No pay deduc   stum duty:N  (25)
Net Salary = 54 584.57

Figure 3 Hard Copy of Salary Calculation Method

| RTG | G H M Rohana Ajith Bandara | | | | | |
|---|---|---|---|---|---|---|
| | RTG | | | | Oct | |
| | CIN | COUT | MOT | OT | | RMK |
| 16 | INO | ONO | 0 | 0 | - | No Finger print |
| 17 | INO | ONO | 0 | 0 | - | No Finger print |
| 18 | INO | ONO | 0 | 0 | - | No Finger print |
| 19 | INO | ONO | 0 | 0 | - | No Finger print |
| 20 | INO | ONO | 0 | 0 | - | No Finger print |
| 21 | INO | ONO | 0 | 0 | - | No Finger print |
| 22 | INO | ONO | 0 | 0 | - | No Finger print |
| 23 | INO | ONO | 0 | 0 | - | No Finger print |
| 24 | INO | ONO | 0 | 0 | - | No Finger print |
| 25 | INO | ONO | 0 | 0 | - | No Finger print |
| 26 | INO | ONO | 0 | 0 | - | No Finger print |
| 27 | INO | ONO | 0 | 0 | - | No Finger print |
| 28 | 12/28/2020 6:54:29 AM | 12/28/2020 5:55:14 PM | 1 | 1 | - | |
| 29 | 12/29/2020 7:04:55 AM | 12/29/2020 5:59:01 PM | 1 | 9 | - | |
| 30 | 12/30/2020 6:46:13 AM | 12/30/2020 6:55:22 PM | 1 | 2 | - | |
| 31 | 12/31/2020 6:37:49 AM | 12/31/2020 4:55:14 PM | 1 | 0 | - | |

**Figure 4: Attendance Details of One person during one month**

PAYMASTER File Creator

Convert to DAT FILE    Bank Branch Codes    Instruction Page

COMMERCIAL BANK
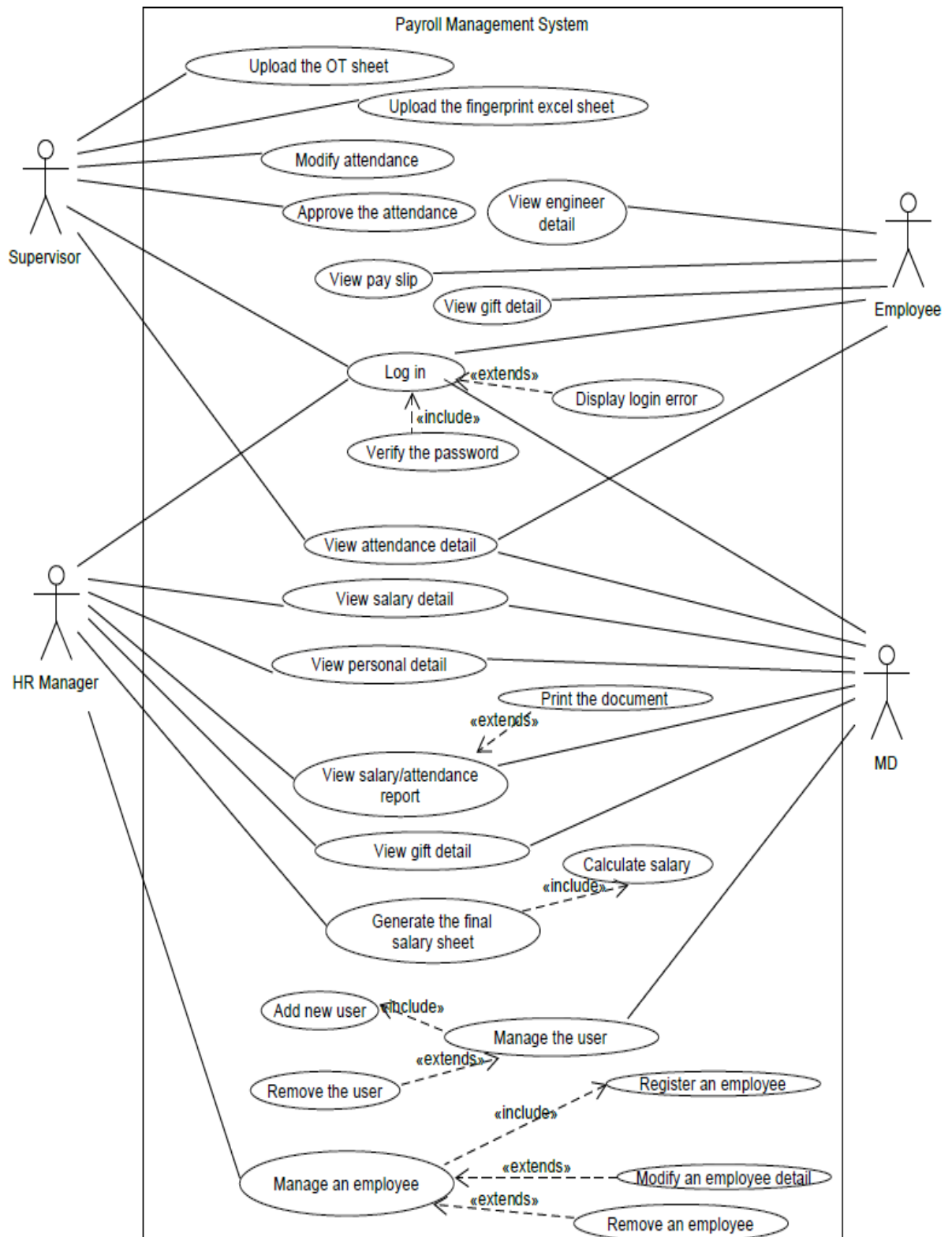
Cr.    2    81,626.56
Dr.    0    -
Debits & Credits Differs, please check before coverting

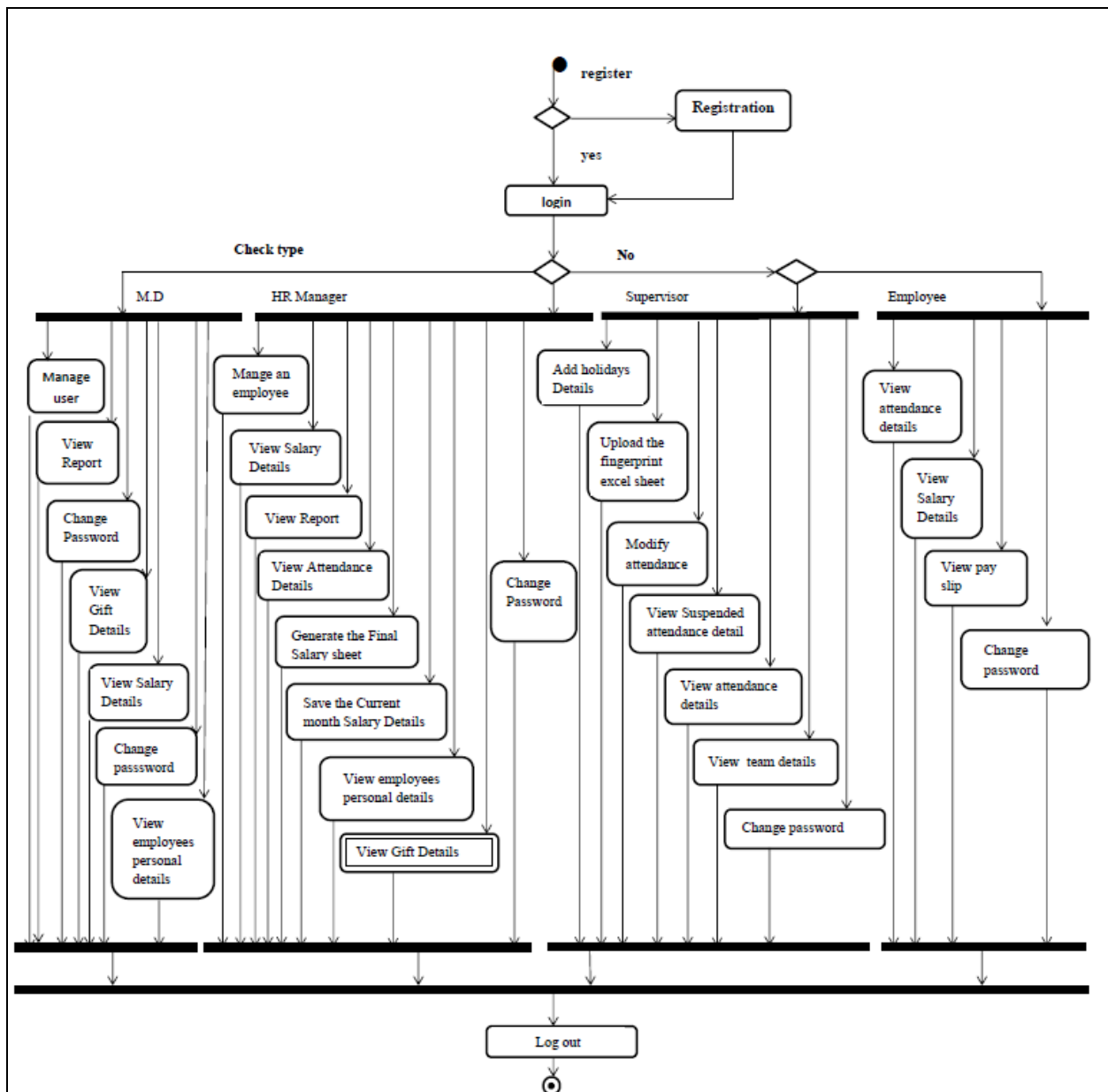| | Tran ID (04) | Destination Bank (04) | Destination Br (03) | Destination Account (12) | Destination Account Name (20) | TRN Code (02) | Return Code (02) | Cr/ Dr Code (01) | Return Date (06) | Amount (12) | Currency Code (03) | Originating Bank (04) | Originating Barnch (03) | Originating Account (12) | Originating Account Name (20) | Particulars (15) | Reference (15) | Value Date (YYMMDD) (06) | Security Field (06) | Filler (01) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7 | 0000 | 7056 | 001 | 008720025719 | J A K G Kumara | 23 | 00 | 0 | 000000 | 000003852403 | SLR | 7056 | 001 | 000123456789 | BPES | J A K G Kumara | SALJAN2021 | 210211 | | @ |
| 8 | 0000 | 7056 | 001 | 008221014115 | L A C Krishantha | 23 | 00 | 0 | 000000 | 000004310253 | SLR | 7056 | 001 | 000123456789 | BPES | L A C Krishantha | SALJAN2021 | 210211 | | @ |

**Figure 5: PayMaster File Creator**

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## 2.2 Diagrams

## 2.2.1 Use Case diagram

## 2.2.2 Activity Diagram

## 2.3 System Specifications

In this section, we specify how the proposed employee management system is organized and what functions are required to perform by every user to achieve this task. These system specifications can be categorized as,

- ➢ Functional requirements
- ➢ Non-functional requirements

## 2.4 Functional Requirements

Functional requirements refer to actions, tasks and activities that the system should satisfy at the end of the day. These tasks should be primarily satisfied by the users in the system. In order to discuss the main functionalities of the system users in the proposed system should be identified. They are as follows,

- Employee
- HR Manager
- Supervisor
- Managing Director
- Admin

2.4.1 Functionalities of Employee

- Login
- View attendance detail
- View salary details
- View pay slip
- Change password

2.4.2 Functionalities of Supervisor

- Login
- Add holiday details
- Upload the fingerprint excel sheet
- Modify attendance
- View attendance detail
- View suspended attendance details

- View team details

- Change password

2.4.3 Functionalities of HR Manager

- Login

- Manage an employee

    - Register an employee

    - Modify an employee

- Generate the final salary sheet

- View OT/attendance reports

- View salary detail
- View attendance details
- View current and resigned employee personal details

- Save the current month salary details at the end of the month

- View gift details

- Change password

2.4.4 Functionalities of Managing Director

- Login
- View attendance detail
- View salary detail
- View current and resigned employee personal details

- View company expenses/OT/attendance Reports

- View gift detail
- Change password

2.4.5 Functionalities Admin

- Login
- Manage the user
  - Add a new user
  - Modify a user
  - Remove a user
- Change password

All user has the forgot password functionality to change their password using the OTP number receives in given email.

## 2.5 Non-Functional Requirements

Non-functional requirements decide the quality of the software system. This is used to judge the operation of a system rather than its behavior. A non-functional requirement is essential to ensure the usability and effectiveness of the entire software system. Failing to meet non-functional requirements can results in a system that fail to satisfy user needs. Below outlined are some of the expectations from the system when implemented.

• Accessibility
All users can login to the system using username and password. When user put those things to the system, system will automatically filter their designation using their username, by that user can easily use their account.

• Efficiency
Employees' salary calculation process can be done easily. Calculating the salaries of employees at the end of the month when uploading the excel sheet data are more efficient than manual process.
Attendance saving process is more efficient than manual process. Employees can view their attendance details (worked days, holidays, public holidays and NOT(Normal Over Time) , OT(Over Time) count).
Employees' registration process can be done easily. Submitting forms and getting notifications are more efficient than manual process.
Generating the reports/charts of the salary and attendance details of employees' process is more efficient for company and employee to identify their current situation.

• Privacy
We are using here user accounts with some privileges. So, there is privacy for every user about their details. Any user can change their password as they wish.
Before login change the password, user should be an active user, also after login change the password, user should have active email, username and current password because change their password using the OTP number receives in given email.

• Reliability
All the data are in a well-built database.

• Usability - Any user can use the system without any difficulty and learn the system quickly.
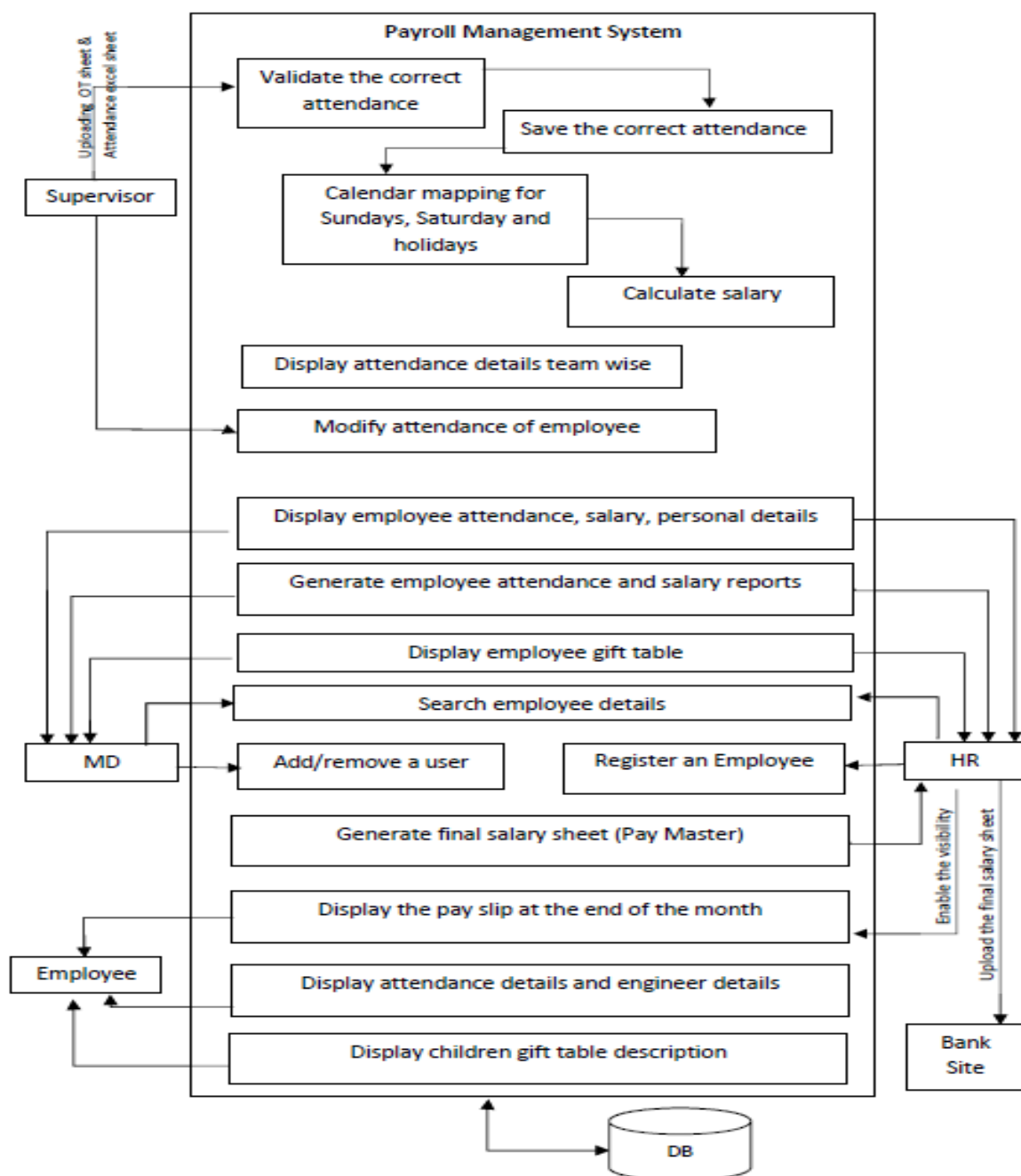
• Security
We use encryption methods to store passwords.

# Chapter 03: Design

## 3.1 Overall view of the project

Overall objective of this chapter is to provide the overall design view of the proposed employee management system with minimum complexity which can lead into easy implementation. This can be achieved by designing a strongly unite system with minimum integrations and reducing the complexity. Providing interface design models that are consistent and user friendly, makes the design stage of the system more straightforward.

The overall system diagram is shown below,

## User Interfaces

In here we are discussing the main interfaces in our project.



**Figure 6:Pay slip**



**Figure 7:Forget password**

**Figure 8:Employee personal details**



**Figure 9:Employee attendance details**

**Figure 10:Employee registration page**



**Figure 11:Employee salary details**

**Figure 12:Edit employee details**



**Figure 13:Edit attendance details**

**Figure 14:Children gift details**



**Figure 15:Team details**

**Figure 16:Modify attendance**



**Figure 17:Modify an employee**

**Figure 18:Suspend attendance details**



**Figure 19:Add holiday details**

**Figure 20:Salary Calculation page**



**Figure 21:Generate Pay master salary sheet**

**Figure 22:Attandance uploading**



**Figure 23:Company Expenses report**
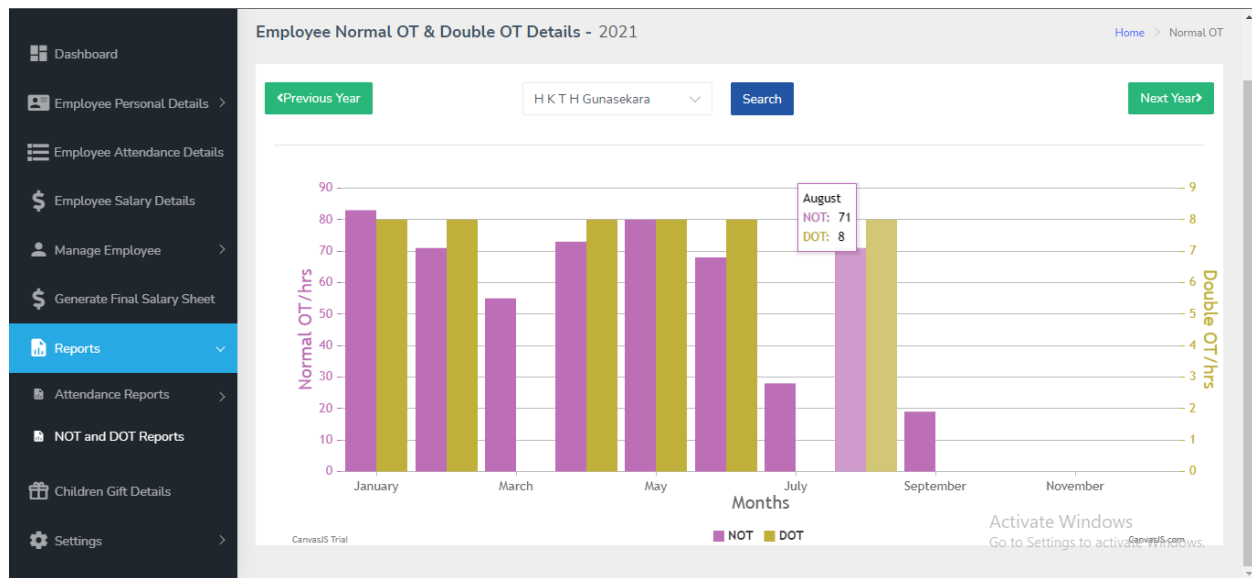
**Figure 24:NOT and DOT report**

## 3.3 Business logic

### 3.3.1 Entity Relationship (ER) Diagram
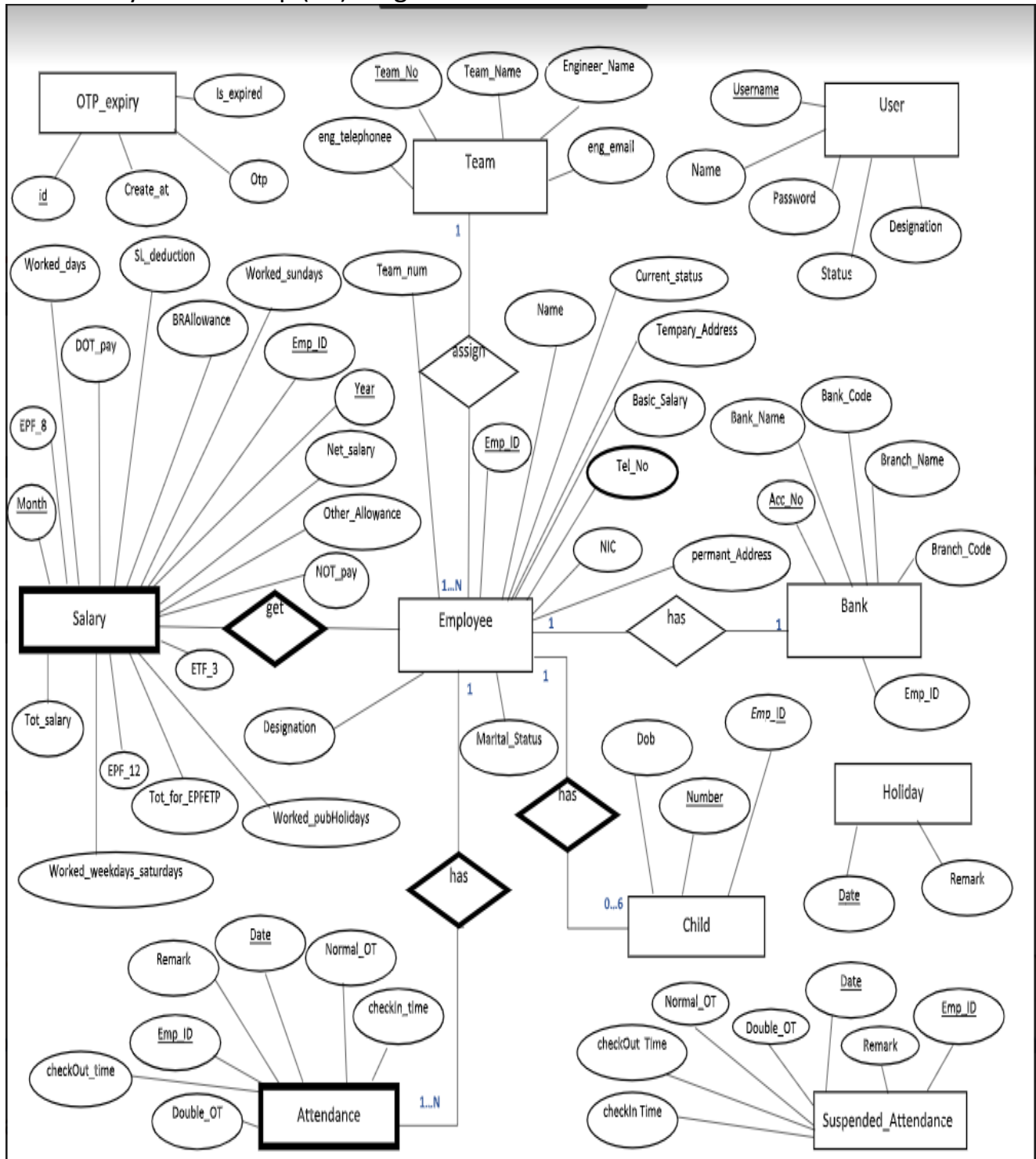
## 3.4 Database Structure/ Design

This section describes the nine tables that are linked to our project. These ten tables are described in the following point

- User

- Team

- Employee

- Bank

- Attendance

- Salary

- Child

- Holiday

- Suspend-Attendance

- OTP-expiry

## User Table

The user table stores the information about employee management users. All of these user data will be in this table.

| Field | Type | Null | Key | Default | Extra |
|-------|------|------|-----|---------|-------|
| Username | varchar(30) | No | PRI | Null | |
| Name | varchar(20) | No | | Null | |
| Password | varchar(100) | No | | Null | |
| Designation | varchar(30) | No | | Null | |
| Status | varchar(10) | No | | Null | |

## Team Table

The table team stores all team data belong to employee through the system added by HR manager. All of these team data will be in this table.

| Field | Type | Null | Key | Default | Extra |
|---|---|---|---|---|---|
| Team_No | Int(11) | No | PRI | Null | |
| Team_Name | varchar(20) | No | | Null | |
| Engineer_name | varchar(30) | No | | Null | |
| eng_telephone | varchar(10) | No | | Null | |
| eng_email | varchar(30) | No | | Null | |

## Employee Table

The table employee stores the information about employee profile. The entire employees who are added by hr-manager in the system will be saved in this table.

| Field | Type | Null | Key | Default | Extra |
|---|---|---|---|---|---|
| Emp_ID | Int(11) | No | PRI | Null | Auto_increment |
| Team_No | Int(11) | No | MUL | Null | |
| Name | varchar(35) | No | | Null | |
| NIC | varchar(12) | No | | Null | |
| Tel_No | varchar(10) | No | | Null | |
| Marital_Status | varchar(20) | No | | Null | |
| Basic_Salary | decimal(10,2) | No | | Null | |
| Permanent_address | varchar(50) | No | | Null | |
| Temporary_address | varchar(50) | Yes | | Null | |
| Current_status | varchar(15) | No | | Null | |

## Bank Table

The table bank stores all bank data belong to employee through the system added by HR manager. All of these bank data will be in this table.

| Field | Type | Null | Key | Default | Extra |
|---|---|---|---|---|---|
| Acc_No | Varchar(25) | No | PRI | Null | |
| Emp_ID | int(11) | No | MUL | Null | |
| Bank_name | Varchar(30) | No | | Null | |
| Bank_code | int(11) | No | | Null | |
| Branch_name | varchar(30) | No | | Null | |
| Branch_Code | int(15) | | | Null | |

## Attendance Table

The table attendance stores all attendance data belong to employee through the system added by him. All of these attendance data will be in this table.

| Field | Type | Null | Key | Default | Extra |
|---|---|---|---|---|---|
| Date | Date | No | PRI | Null | |
| Emp_ID | int(11) | No | PRI | Null | |
| checkIn_Time | Time | No | | Null | |
| checkOut_Time | Time | No | | Null | |
| Normal_OT | Decimal(10,0) | Yes | | 0 | |
| Double_OT | Decimal(10,0) | Yes | | 0 | |
| Remark | varchar(30) | Yes | | Weekday | |

## Salary Table

The table salary stores all salary data belong to employee through the system added by hr-manager. All of these salary data will be in this table.

| Field | Type | Null | Key | Default | Extra |
|---|---|---|---|---|---|
| Emp_ID | int(11) | No | PRI | Null | |
| Year | Year(4) | No | PRI | Null | |
| Month | Varchar(20) | No | PRI | Null | |
| Worked_days | int(11) | No | | Null | |
| worked_weekdays_saturdays | int(11) | Yes | | Null | |
| Worked_sundays | int(11) | Yes | | Null | |
| Worked_pubHolidays | int(11) | Yes | | Null | |
| BRAllowance | Decimal(30,2) | No | | Null | |
| tot_for_EPFETF | Decimal(30,2) | No | | Null | |
| EPF_12 | Decimal(30,2) | No | | Null | |
| ETF_3 | Decimal(30,2) | No | | Null | |
| Other_llowance | Decimal(30,2) | No | | Null | |
| DOT_pay | Decimal(30,2) | Yes | | Null | |
| NOT_pay | Decimal(30,2) | Yes | | Null | |
| Net_salary | Decimal(30,2) | No | | Null | |
| EPF_8 | Decimal(30,2) | No | | Null | |
| SL_deduction | Decimal(30,2) | No | | Null | |
| tot_salary | Decimal(40,2) | No | | Null | |

## Child Table

The table child stores all child data belong to employee through the system added by HR manager. All of these child data will be in this table.

| Field | Type | Null | Key | Default | Extra |
|---|---|---|---|---|---|
| Number | int(11) | No | PRI | Null | Auto_increment |
| Emp_ID | int(11) | No | | Null | |
| DOB | Date | No | | Null | |

## Holiday Table

The table holiday stores all holiday data belong to employee through the system added by supervisor. All of these holiday data will be in this table.

| Field | Type | Null | Key | Default | Extra |
|-------|------|------|-----|---------|-------|
| Date | Date | No | PRI | Null | |
| Remark | varchar(50) | No | | Null | |

## Suspended-Attendance Table

The table suspended-Attendance stores all suspended-Attendance data belong to employee through the system added by supervisor. All of these suspended-Attendance data will be in this table.

| Field | Type | Null | Key | Default | Extra |
|-------|------|------|-----|---------|-------|
| Date | Date | No | PRI | Null | |
| Emp_ID | int(11) | No | PRI | Null | |
| checkIn_Time | Time | No | | Null | |
| checkOut_Time | Time | No | | Null | |
| Normal_OT | Decimal(10,0) | Yes | | 0 | |
| Double_OT | Decimal(10,0) | Yes | | 0 | |
| Remark | varchar(30) | Yes | | Saturday | |

## OTP-expiry Table

| Field | Type | Null | Key | Default | Extra |
|-------|------|------|-----|---------|-------|
| id | INT(11) | No | PRI | Null | Auto_increment |
| otp | VARCHAR(10) | No | | Null | |
| is_expired | INT(11) | No | | Null | |
| create_at | DATETIME | No | | Null | |

# Chapter 04: Implementation

## 4.1 TOOLS USED FOR SYSTEM DEVELOPMENT

PHP is a server-side scripting language, and a powerful tool for making dynamic and interactive Web pages. We used PHP as the main programming language to build our website.

JavaScript is most commonly used as a client-side scripting language. This means that JavaScript code is written in HTML page. JavaScript is used to develop some functions of our web site.

Ajax and MySQL is used to create the database. MySQL is a relational database management system based on SQL (Structured Query Language).

All the main graphical user interfaces are based on manual template.

Bootstrap is used to develop interfaces. Therefore, we got rid of writing our own CSS classes to style webpage elements.

| Tool/Language | Version |
|---|---|
| Xampp Server | 7.4.1 |
| Apache | 2.4.41 |
| PHP | 7.2.26 |
| MySQL | 5.0.12 |
| JavaScript | 3.4.1 |
| Bootstrap | 4.8 |
| Html | |
| CSS | |

**Table 1: Tools used for system development**

## Xampp Server



XAMPP is a free and open-source cross-platform web server solution stack package developed by Apache Friends, consisting mainly of the Apache HTTP Server, Maria DB data base, and interpreters for scripts written in the PHP and Perl Programming Languages.

Since most actual web server deployments use the same components as XAMPP, it makes transitioning from a local test server to a live server possible.

XAMPP's ease of deployment means a WAMP or LAMP stack can be installed quickly and simply on an operating system by a developer, with the advantage that common add-in applications such as Wordpress and Joomla! can also be installed with similar ease using Bitnami.

## MySQL Database Server



MySQL is an open-source relational database management system (RDBMS). Its name is a combination of "My", the name of co-founder Michael Widenius's daughter, and "SQL", the abbreviation for Structured Query Language.

MySQL is free and open-source software under the terms of the GNU General Public License, and is also available under a variety of proprietary licenses.

MySQL was owned and sponsored by the Swedish company MySQL AB, which was bought by Sun Microsystems (now Oracle Corporation). In 2010, when Oracle acquired Sun, Widenius forked the open-source MySQL project to create MariaDB.

MySQL is a component of the LAMP web application software stack (and others), which is an acronym for Linux, Apache, MySQL, Perl/PHP/Python.

MySQL is used by many database-driven web applications, including Drupal, Joomla, phpBB, and WordPress.

MySQL is also used by many popular websites, including Facebook, Flickr, MediaWiki, Twitter, and YouTube.

## PHP (PHP Hypertext Pre-Processor)



PHP is a server-side scripting language designed primarily for web development but also used as a general-purpose programming language.

It was originally created by Danish-Canadian programmer Rasmus Lerdorf in 1994.

The PHP reference implementation is now produced by The PHP group.

PHP originally stood for personal Home Page but it now stands for the recursive initialism PHP: Hypertext Preprocessor.

## Apache Web Server



Apache Web Server is an open-source web server creation, deployment and management software.

Initially developed by a group of software programmers, it is now maintained by the Apache Software Foundation.

Apache Web Server is designed to create web servers that have the ability to host one or more HTTP-based websites.

Apache is configured with plain text files, while there are GUI (Graphical User Interface) tools or configuring Apache.

The command palette holds infrequently used functionality, like sorting, changing the syntax and changing the indentation settings.

Get the most of your wide screen monitor with split editing support. Edit files side by side, or edit two locations in the one file. You can edit with as many rows and columns as you wish.

## JavaScript



JavaScript often abbreviated as JS, is a high level, interpreted programming language that conforms to the ECMAScript specification.

It has curly-bracket syntax, dynamic typing, prototype-based object-orientation, and first-class functions.

Alongside HTML and CSS, JavaScript is one of the core technologies of the World Wide Web.

Although there are similarities between JavaScript and Java, including language name, syntax, and respective standard libraries, the two languages are distinct and differ greatly in design.

HTML



HTML- HTML or Hyper Text Mark-up Language is the main mark-up language for creating web pages and other information that can be displayed in a web browser.

HTML is written in the form of HTML elements consisting of tags enclosed in angle brackets (like <html>), within the web page content.
The purpose of a web browser is to read HTML documents and compose them into visible or audible web pages.

It provides a means to create structured documents by denoting structural semantics for text such as headings, paragraphs, lists, links, quotes and other items.

It can embed scripts written in languages such as JavaScript which affect the behavior of HTML web pages.

# CSS



Cascading Style Sheets (CSS) is a style sheet language used for describing the look and formatting of a document written in a mark-up language. While most often used to style web pages and interfaces written in HTML and XHTML, the language can be applied to any kind of XML document, including plain XML, SVG and XUL.

CSS is a cornerstone specification of the web and almost all web pages use CSS style sheets to describe their presentation.CSS is designed primarily to enable the separation of document content from document presentation, including elements such as the layout, colours, and fonts.

This separation can improve content accessibility, provide more flexibility and control in the specification of presentation characteristics, enable multiple pages to share formatting, and reduce complexity and repetition in the structural content (such as by allowing for table less web design).

CSS can also allow the same mark-up page to be presented in different styles for different rendering methods, such as on-screen, in print, by voice (when read out by a speech-based browser or screen reader) and on Braille-based, tactile devices.

It can also be used to allow the web page to display differently depending on the screen size or device on which it is being viewed.

## Bootstrap



Bootstrap is a free and open-source CSS framework directed at responsive, mobile-first front-end web development.

It contains CSS and (optionally) JavaScript-based design templates for typography, forms, buttons, navigation, and other interface components.

Bootstrap is the sixth-most-starred project on GitHub, with more than 135,000 stars, behind freeCodeCamp (almost 307,000 stars) and marginally behind Vue.js framework.

According to Alexa Rank, Bootstrap is in the top-2000 in the USA while Vue.js Organization is in the top-7000 in the USA.

# Chapter 05: System Testing

## 5.1 Testing Methodology

Since the system developed by **five** developers, each developer performed daily building & smoke testing phase daily.

The unit testing was done using sample data sets.

Afterward, each developer exchanged their developments with other members in the group to detect errors.

Each member listed down what are the functionalities which should be changed.

Development components that every member completed (within__) were integrated and tested.

Since there were not completely separate modules, we had to integrate testing periodically.

Moreover, we got the opinions of the supervisors to complete the product successfully.

We discussed with our supervisors and changed the system appearance into the user-friendly manner.

Initially, our supervisors gave feedback to do documentation such as use case, test case etc.

Then, the system was run using different web browsers and checked the browser compatibility (Google chrome, Firefox).

Finally, the completed product was given to our course unit coordinator and got their feedback and fixed the mistakes.

## 5.2 Test Cases

| Test Case | Test Data | Steps to Perform | Expected Result |
|---|---|---|---|
| Login with Valid Username & Password | Valid Username<br><br>Valid Password | Enter Username<br>Ex: charani93<br><br>Enter Password<br>Ex: charani123 | Username entered to the Username field.<br><br>Password entered to the Password field and characters are hidden as dots. |
| Login with Invalid Username & Password | Invalid Username | Enter Username | Login Error. Please check again! |
| | Invalid Password | Enter Password | |
| Forget Password | Enter valid Username and Email Address | Enter the generated OTP in inbox of given email.<br>Then enter the new password details and confirm it. | Give an alert 'Password has been successfully updated!' and goes to the log in page. |
| Employee Registration | **Input Personal Details**<br><br>-Employee Name | -Input Employee name | **If all required data are entered then goes to the next section, Account Details**<br>-Can enter letters only. |
| | -Employee NIC | -Input Employee NIC | - Should be within the format 961301450V/19961301450 |
| | -Employee Telephone Number | - Input Employee Telephone Number | - Can enter 10 digits only. |
| | -Employee Basic Salary Amount | - Input Employee Basic Salary Amount | - Can enter digits only. |
| | **Input Account Details**<br><br>-Bank Name | -Should select a Bank<br>Ex: Peoples Bank | **If all required data are entered then goes to the next section, Other Details**<br>-Bank Selected |
| | -Branch Name | - Should select a Branch<br>Ex: Matara | -Branch Selected |

| | -Account Number | - Input Account Number | -Can enter digits. |
|---|---|---|---|
| | **Input Other Details**<br><br>**-** Team | - Should Select a Team<br>Ex: HIPG | **If all required data are entered then goes to the next section, Summary.**<br>-Team Selected |
| | - Marital Status | - Select Marital Status<br>Ex: Married | - If we input married then it goes to Having Children and then goes to Children Details. |
| | **Summary** | Click "I Agree with the Terms and Conditions" | Give an alert 'Employee has been successfully registered' and then goes to Current employee personal details page. |
| Modify an Employee | -You can only change the selected employee's basic salary, telephone number, bank details and giving a new address.<br>-Also can change the employee current status as 'Employed' or 'Resigned' | - Enter new basic salary<br>-Enter a temporary address<br>-Select a new bank and branch<br>-Click the 'Save Changes' button | Give an alert 'Successfully updated' and goes to 'Modify Employee Details' page |
| Attendance Report NOT and DOT Report | Search by the employee name | -Select the employee name<br>-Click the 'Previous Year' button to check previous year report | Show the relevant graph for the data entered.<br>Ex: Worked Days Graph of H K T H Gunasekara |

| | | | |
|---|---|---|---|
| Add Attendance Details | | Upload fingerprint excel sheet | If the upload file doesn't match with xlsx format, then give an alert 'This file extension is not allowed. Please upload an Excel file' and then redirect to the 'Supervisor Add attendance details' page.

If the upload fingerprint file doesn't in current month attendance details, then give an alert 'Please input the current month attendance details only' and again redirect to the same page.

If the uploaded fingerprint file is the same file you uploaded about same date of current month, give an alert 'Duplicate entry of the same attendance. Please Check Again!' and again redirect to same page.

If all the conditions are satisfied then give an alert 'The file has been successfully uploaded' and goes to the 'Supervisor modify attendance' page. |
| Modify Attendance | Only can change the check in time and check out time. | Select the time to be update either check in time or check out time.<br>Ex: '07:00:03'<br>Ex: '20:05:03' | Give an alert 'Successfully Updated' and goes to 'Supervisor modify attendance' page. |
| Generate the Final Salary Sheet | | Click the 'Generate the PayMaster Sheet' button | Successfully download the Pay Master excel sheet. |
| Employee Personal, Attendance, Salary and Gift Details | **Search by**<br>-ID | -Input valid Emp_ID<br>Ex: 2 | -Display Relevant Details of selected Emp_ID |

| | | - Input invalid Emp_ID Ex: d/200 | - Not Found. |
|---|---|---|---|
| Employee Personal, Attendance and Salary Details | **Search by** - Name | - Input valid Name 'H K T H Gunasekara' | -Display Relevant Details of selected Name |
| | | - Input invalid Name Ex:Nuwani1996 | - Not Found. |
| Employee Attendance Details | **Search by Date** | -Select only one date from Calendar or - Select a Date Range from Calendar | - Display Attendance Details of selected Date - Display Attendance Details of relevant Date Range. -If the attendance details cannot find according to selected date/date range, give an alert 'Not Found'. |
| Employee Salary Details | **Search by** -Year | - Input a valid Year | - Display Salary Details of relevant Year |
| | | - Input an invalid Year | If the salary details cannot find according to given year, give an alert 'Not Found'. |
| | -Month | - Select a Month | Display Salary Details of relevant month |
| Salary Calculation | | At the end of the current month the 'Save Salary Details' button enabled then click this button. | Give an alert 'Successfully save the salary details' and goes to the 'HR manager employee salary details' page. |
| | | Click the button again after saving the salary details. | Give an alert 'The salary details has been already saved' and redirect to the current page. |

# Chapter 06: Conclusion and Future Development

## 6.1 Conclusion

In conclusion we can say that our restless effort has successfully developed the project following the requirements and activated it without any error and inconsistency.

Overall, the project teaches us the essential skills such as:

- Using system analysis and design techniques such as data flow diagram in designing the system.
- Understanding the database handling and query processing.
- Web designing.
- Understanding PHP program structure.
- Writing codes in PHP programs and relating them among the classes and files.

we smooth and efficiency in current process of BPES company.

- Employees' salary calculation process can be done easily.
- Attendance saving process is more efficient than manual process.
- Employees' registration process can be done easily.
- Generating the reports/charts of the salary and attendance details of employees' process is more efficient for company and employee to identify their current situation.

Finally, we can say that this project performs in its best possible manner in order to expedite daily activates of course unit.

## 6.2 Future Developments

The initial focus of this project was developing a secured integrated system. This project can be further improved if the following can be incorporated.

- Update system every year.
- Use a Sri Lankan holiday mapping function without saving the holidays in the database.
- Send messaging alert to the company owner about updates.

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We have used many resources during the development of the project, and for that, we are grateful to all the people concerned.

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